Space Weather Forecast

Issued on Thursday 14 November 2024 at 13:10 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate radio blackouts (R1/R2) possible. Slight chance of G1/Minor Geomagnetic Storms, mainly 14 and 17 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the past 24-hours with one isolated Moderate flare, peaking at 13/1708 UTC from sunspot region AR3889.

There are now five sunspot regions on the visible disc, with sunspot AR3891 fading from view and AR3894 emerging and numbered in the north-east. Sunspot region AR3889, in the south-west, is by far the largest and most complex region. It consists of two main clusters of mature spots. The remaining regions are relatively small and simple.

No Coronal Mass Ejections (CMEs) observed over the past 24 hours are considered to have an Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar winds were initially indicative of a slow regime but rose steadily from approximately 14/0300UTC under the likely influence of an approaching faster solar wind stream. Wind speeds initially around 330km/s increased to between 380-410km/s. The interplanetary magnetic field (IMF), Bt, initially weak, also saw a steady increase following fast wind arrival, becoming persistently moderate. The important north-south component, Bz, mostly varied weakly, but became more moderate following faster wind arrival, initially moderately positive but recently falling negative. Geomagnetic activity was Quiet to Unsettled (Kp0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity expected, with a chance of Moderate flares and a slight chance of Strong flares, mostly from the largest sunspot.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast.

Connection to a faster solar wind is ongoing Day 1 (14 Nov) with slightly elevated wind speeds which could then persist for much of the period. Geomagnetic activity is expected to be largely Quiet to Unsettled (Kp1-3). On Day 1 (14 Nov), Active (Kp4) conditions are possible with a slight chance of G1/Minor Geomagnetic Storm intervals (Kp5). During Days 2-3 there remains a very

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slight chance of further G1/Minor Geomagnetic Storm intervals. This risk then rising again on Day 4 (17 Nov) with a possible connection to another fast wind stream.

Energetic Particles / Solar Radiation: High energy proton flux is most likely to remain at background levels with Solar Radiation storms unlikely. There is a slight chance of S1/Minor solar radiation storms due to the potential for flaring from the largest sunspot group as it rotates westward across the Sun.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	50	50	50	50
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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